Code No.: R22CS303PC | R22 | H.T.No. | | | 8 | R | | | | | |

CMR ENGINEERING COLLEGE: : HYDERABAD
UGC AUTONOMOUS
II–B.TECH–I–Semester End Examinations (Supply) - June- 2025
OPERATING SYSTEMS
(Common for CSE, IT, CSC, CSD, CSM)

[Time: 3 Hours] **[Max. Marks: 60]**

Note: This question paper contains two parts A and B.
Part A is compulsory which carries 10 marks. Answer all questions in Part A.
Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

PART-A **(10 Marks)**

1.	a)	What is an Operating system? What are the various OS Components?	[1M]
	b)	Differentiate between Multi-programming and Multi-processing.	[1M]
	c)	What are the necessary and sufficient conditions to occur deadlock?	[1M]
	d)	What are the CPU Scheduling Algorithms?	[1M]
	e)	Describe about Race Conditions.	[1M]
	f)	What is Critical Section problem?	[1M]
	g)	What is the difference between Page and Segment?	[1M]
	h)	Define Page Fault.	[1M]
	i)	What is a File Allocation Table (FAT)?	[1M]
	j)	Write down the Principles of protection in File Systems.	[1M]

PART-B **(50 Marks)**

2.		Describe evolution of Operating System in detail.	[10M]
		OR	
3.	a)	Explain about the structure of OS.	[5M]
	b)	Explain about the services of Operating System.	[5M]
4.		Explain FCFS and SJF Scheduling Algorithm with examples.	[10M]
		OR	
5.		Explain about the system calls fork, exit, wait, waitpid and exec.	[10M]
6.		Give Peterson solution for Critical Section problem.	[10M]
		OR	
7.	a)	Explain Process States with suitable diagram.	[5M]
	b)	Explain the concept of Semaphores. Illustrate with an example.	[5M]
8.	a)	Differentiate between Internal Fragmentation and External Fragmentation.	[5M]
	b)	What is Belady's Anomaly? Explain with one example.	[5M]
		OR	
9.		Consider the following page reference strings: 1,2,3,4,2,1,5,6,2,1,2,3,7,6,3,2,1,2,3,6. How many page faults would occur for the following replacement algorithm, assuming three, four frames? Remember that all frames are initially empty, so your first unique pages will cost one fault each. a) LRU replacement b) Optimal replacement.	[10M]
10.	a)	Explain about the Free Space Management.	[5M]
	b)	Explain about the Linear List and Hash Table data structures to implement a directory.	[5M]
		OR	
11.		Discuss in detail about various File Allocation Methods.	[10M]

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